

CLAIMS

What is claimed is:

- 1 1. A device for removable attachment to a fluid container of the type including a
2 threaded neck surrounding a discharge opening in fluid communication with an
3 interior chamber of the fluid container, the device comprising:
4 a rigid handle portion;
5 a manually operated pump mechanism coupled to the handle portion, the pump
6 mechanism operative to introduce a charge of pressurized air into the
7 interior of the fluid container, wherein the pump mechanism includes a
8 squeeze bulb;
9 an air delivery conduit providing fluid communication between the pump
10 mechanism and the interior of the fluid container; and
11 a head portion including:
12 threads for threaded engagement with the threaded neck of the fluid
13 container thereby providing a substantially airtight seal between
14 the device and the discharge opening of the fluid container to
15 contain the charge of pressurized air and the fluid within the
16 interior chamber of the fluid container; and
17 a valve spout operable between a closed position to contain the fluid and
18 the charge of pressurized air within the interior of the fluid
19 container, and an open position to permit dispensing of the fluid
20 through the discharge opening and from the valve spout;
21 wherein rotation of the squeeze bulb relative to the handle portion is prevented.
- 1 2. A device as recited in claim 1, wherein the pump mechanism comprises:
2 a central body surrounding a compressible interior air chamber and
3 operable between a normally relaxed full state and a compressed state;
4 a first end portion;

5 a second end portion;
6 a one-directional intake valve for drawing air into the interior air
7 chamber upon the central body returning to the relaxed state from the
8 compressed state; and
9 a one-directional exhaust valve on the second end portion for
10 directing air outwardly from the interior air chamber and to the air
11 delivery conduit upon the central body being compressed from the relaxed
12 state to the compressed state.

1 3. A device as recited in claim 2, wherein rotation of the squeeze bulb relative to the
2 handle portion is prevented by holding the second end portion in a substantially
3 fixed position relative to the handle portion.

1 4. A device as recited in claim 3, wherein the second end of the squeeze bulb is
2 keyed, wherein the handle portion includes a receptacle adapted for keyed receipt
3 of the second end portion of the squeeze bulb to prevent rotation of the squeeze
4 bulb relative to the handle portion upon operation of the manually operated pump
5 mechanism between the normally relaxed full state and the compressed state.

1 5. A device as recited in claim 4, wherein the keyed second end portion of the
2 squeeze bulb is defined by a multi-sided outer surface, the receptacle of the
3 handle portion having a shape operably congruent to the multi-sided outer surface
4 of the second end portion.

1 6. A device as recited in claim 1, wherein the seal comprises a flexible resilient seal
2 member including an upper portion, a lower portion, an opening communicating
3 with the discharge opening of the fluid container, and a dish-shaped concave
4 portion on the upper portion and defining a valve seat for mating engagement
5 with the valve spout.

- 1 7. A device as recited in claim 6, wherein the seal further comprises a rigid ring
2 member fitted to the resilient seal member between the upper portion and the
3 lower portion thereof, the rigid ring member including a connection to the air
4 delivery conduit for permitting airflow from the airflow delivery conduit to the
5 interior chamber of the fluid container.
- 1 8. A device as recited in claim 7, wherein the rigid ring member defines means for
2 providing structural integrity to the flexible resilient seal member to prevent
3 collapsing and distortion of the flexible resilient seal member upon operation of
4 the valve spout between the open and closed positions so that the dish-shaped
5 concave portion is maintained in sealed engagement with the valve spout.
- 1 9. A device as recited in claim 8, wherein the seal further comprises a cap fitted
2 within the head portion of the main body and including interior threads for
3 threaded engagement and attachment to the threaded neck of the fluid container
4 and the cap including a central opening structured and disposed for alignment
5 with the discharge opening of the fluid container, and an annular top surface
6 surrounding the central opening, the annular top surface being structured and
7 disposed for mating, sealed engagement with the lower portion of the flexible
8 resilient seal member.
- 1 10. A device as recited in claim 1, wherein the air delivery conduit comprises a
2 flexible air hose.
- 1 11. A device as recited in claim 1, further comprising a lever for directing operation
2 of the valve spout, wherein the lever is positioned opposite the handle portion
3 with respect to the neck of the container for acting as a counterweight.

1 12. A device as recited in claim 1, further comprising a lever for directing operation
2 of the valve spout, wherein the lever is positioned on a same side of the container
3 as the handle portion with respect to the neck of the container.

1 13. A pump handle device, comprising:
2 a rigid handle portion;
3 a manually operated pump mechanism fitted to the handle portion and including a
4 collapsible pump comprising:
5 a central body surrounding a compressible interior air chamber and
6 operable between a normally relaxed full state and a
7 compressed state;
8 a first end portion;
9 a second end portion;
10 a one-directional intake valve means for drawing air into the
11 interior air chamber upon the central body returning to the
12 relaxed state from the compressed state; and
13 a one-directional exhaust valve means on the second end portion
14 for directing air outwardly from the interior air chamber
15 and to the air delivery means upon the central body being
16 compressed from the relaxed state to the compressed state;
17 and
18 a coupling mechanism for securing the collapsible pump to the handle
19 portion and including a mechanism for holding the second end
20 portion in fixed position relative to the handle portion.

1 14. A device as recited in claim 13, wherein the coupling mechanism is structured and
2 disposed to prevent obstruction of airflow exiting the one-directional exhaust
3 valve means.

- 1 15. A device as recited in claim 14, further comprising an air delivery means
2 interconnected to the pump mechanism for directing airflow from the pump
3 mechanism to a separate chamber.
- 1 16. A device as recited in claim 15, wherein the coupling mechanism is structured and
2 disposed to prevent obstruction of airflow through the air delivery means.
- 1 17. A device as recited in claim 16, wherein the air delivery means comprises a
2 flexible air hose.
- 1 18. A device as recited in claim 17, wherein the coupling mechanism is structured and
2 disposed to prevent twisting and kinking of the flexible air hose.
- 1 19. A device as recited in claim 17, wherein the collapsible pump is a squeeze bulb.
- 1 20. A device as recited in claim 17, wherein the collapsible pump is a bellows.
- 1 21. A device as recited in claim 13, wherein the coupling mechanism is an adhesive.
- 1 22. A device as recited in claim 13, wherein the coupling mechanism is a semi-rigid
2 tube.
- 1 23. A device as recited in claim 13, wherein the pump has ends and a peripheral
2 midpoint therebetween, an outlet of the pump being positioned towards an end of
3 the pump, an air inlet of the pump being positioned towards a peripheral midpoint
4 of the pump.
- 1 24. A device as recited in claim 13, wherein the pump has ends and a peripheral
2 midpoint therebetween, an outlet of the pump being positioned towards an end of

3 the pump, an air inlet of the pump being positioned between an end and peripheral
4 midpoint of the pump.

1 25. A device for removable attachment to a fluid container of the type including a
2 neck surrounding a discharge opening in fluid communication with an interior
3 chamber of the fluid container, the device comprising:
4 a rigid handle portion;
5 a manually operated pump mechanism coupled to the handle portion, the pump
6 mechanism operative to introduce at least one charge of pressurized air
7 into the interior of the fluid container, wherein the pump mechanism
8 includes a collapsible pump, wherein rotation of the collapsible pump
9 relative to the handle portion is reduced;
10 an air delivery conduit providing fluid communication between the pump
11 mechanism and the interior of the fluid container; and
12 a head portion including:
13 a container-engaging portion for coupling to the neck of the fluid
14 container;
15 a fluid conduit for positioning in the interior of the fluid container;
16 a discharge opening in selective fluid communication with the fluid
17 conduit; and
18 a valve operable between a fully open position and a closed position, the
19 valve permitting fluid from the fluid container to pass through the
20 discharge opening when not in a closed position.

1 26. A device as recited in claim 25, wherein the pump mechanism comprises:
2 a central body surrounding a compressible interior air chamber and
3 operable between a normally relaxed full state and a compressed state;
4 a first end portion;
5 a second end portion;

6 a one-directional intake valve for drawing air into the interior air
7 chamber upon the central body returning to the relaxed state from the
8 compressed state; and
9 a one-directional exhaust valve on the second end portion for
10 directing air outwardly from the interior air chamber and to the air
11 delivery conduit upon the central body being compressed from the relaxed
12 state to the compressed state.

1 27. A device as recited in claim 26, wherein the second end portion is held in a
2 substantially fixed position relative to the handle portion for preventing rotation
3 of the squeeze bulb relative to the handle portion.

1 28. A device as recited in claim 27, wherein the second end of the squeeze bulb is
2 keyed, wherein the handle portion includes a receptacle adapted for keyed receipt
3 of the second end portion of the squeeze bulb to prevent rotation of the squeeze
4 bulb relative to the handle portion upon operation of the manually operated pump
5 means between the normally relaxed full state and the compressed state.

1 29. A device as recited in claim 28, wherein the keyed second end portion of the
2 squeeze bulb is defined by a multi-sided outer surface, the receptacle of the
3 handle portion having a shape congruent to the multi-sided outer surface of the
4 second end portion.

1 30. A device as recited in claim 25, wherein the fluid discharge opening is a spray
2 nozzle.

1 31. A device as recited in claim 30, wherein the spray nozzle is adjustable for
2 changing a spray pattern of a fluid stream flowing therefrom, the spray pattern
3 being selectable from a group consisting of a mist, a conical spray, and a stream.

- 1 32. A device as recited in claim 30, wherein the spray nozzle forms a fan spray
2 pattern of a fluid stream flowing therefrom.
- 1 33. A device as recited in claim 30, wherein the spray nozzle forms a foam from a
2 fluid stream flowing therefrom.
- 1 34. A device as recited in claim 25, wherein the fluid is a hard surface cleaning fluid.
- 1 35. A device as recited in claim 25, wherein the fluid is a cleaner for clothing.
- 1 36. A device as recited in claim 25, wherein the fluid includes a biocide.
- 1 37. A device as recited in claim 25, wherein the fluid includes at least one of an
2 insecticide, an insect repellant, an herbicide, and mixtures thereof.
- 1 38. A device as recited in claim 25, wherein a flow rate of the fluid flowing through
2 the discharge opening is controllable by positioning the valve between the closed
3 position and the fully open position, the flow rate increasing in a substantially
4 linear fashion as the valve moves from the closed position to the fully open
5 position under constant pressure.
- 1 39. A device as recited in claim 25, wherein the valve is controllable via a trigger.
- 1 40. A device as recited in claim 39, wherein the trigger is adapted for actuation by an
2 index finger of a human.
- 1 41. A device as recited in claim 39, wherein the trigger is adapted for actuation by a
2 thumb of a human.

- 1 42. A device as recited in claim 25, wherein only one human hand is required to
2 simultaneously hold the device, operate the pump mechanism, operate the valve,
3 and aim the fluid discharge opening.
- 1 43. A device as recited in claim 25, wherein the pump is a squeeze bulb.
- 1 44. A device as recited in claim 25, wherein the pump is a bellows.
- 1 45. A device as recited in claim 25, wherein the pump has ends and a peripheral
2 midpoint therebetween, an outlet of the pump being positioned towards an end of
3 the pump, an air inlet of the pump being positioned towards a peripheral midpoint
4 of the pump.
- 1 46. A device as recited in claim 25, wherein the pump has ends and a peripheral
2 midpoint therebetween, an outlet of the pump being positioned towards an end of
3 the pump, an air inlet of the pump being positioned between an end and peripheral
4 midpoint of the pump.
- 1 47. A spraying device; comprising
2 a fluid container including an interior chamber;
3 a manually operated pump coupled to the fluid container, the pump operative to
4 introduce at least one charge of pressurized air into the interior of the fluid
5 container;
6 a discharge opening in selective fluid communication with the interior chamber;
7 and
8 a valve operable between a fully open position and a closed position, the valve
9 permitting fluid from the fluid container to pass through the discharge
10 opening when not in a closed position.

- 1 48. A device as recited in claim 47, wherein a human cannot access the interior
2 chamber for refilling the chamber without damaging the device.
- 1 49. A device as recited in claim 47, wherein the pump is positioned below the
2 discharge opening when the device is positioned in an upright position.
- 1 50. A device as recited in claim 49, wherein an air inlet of the pump is hidden from
2 view by a shield when viewing a profile of the device.
- 1 51. A device as recited in claim 47, wherein the pump is positioned above the
2 discharge opening when the device is positioned in an upright position.
- 1 52. A device as recited in claim 47, wherein the pump is positioned behind the
2 discharge opening when the device is positioned in an upright position.
- 1 53. A device as recited in claim 47, wherein the valve is controllable via a trigger.
- 1 54. A device as recited in claim 53, wherein the trigger is adapted for actuation by an
2 index finger of a human.
- 1 55. A device as recited in claim 53, wherein the trigger is adapted for actuation by a
2 thumb of a human.
- 1 56. A device as recited in claim 47, wherein only one human hand is required to
2 simultaneously hold the device, operate the pump mechanism, operate the valve,
3 and aim the fluid discharge opening.
- 1 57. A device as recited in claim 47, further comprising a pressure release valve in
2 fluid communication with the interior of the container.

- 1 58. A device as recited in claim 47, wherein the fluid discharge opening is a spray
2 nozzle.
- 1 59. A device as recited in claim 58, wherein the spray nozzle forms a fan spray
2 pattern of a fluid stream flowing therefrom.
- 1 60. A device as recited in claim 58, wherein the spray nozzle forms a foam from a
2 fluid stream flowing therefrom.
- 1 61. A device as recited in claim 47, wherein the discharge opening is adjustable for
2 changing a spray pattern of a fluid stream flowing therefrom, the spray pattern
3 being selectable from a group consisting of a mist, a conical spray, and a stream.
- 1 62. A device as recited in claim 47, wherein fluid exiting the discharge opening is in
2 the form of a foam.
- 1 63. A device as recited in claim 47, wherein the fluid is a hard surface cleaning fluid.
- 1 64. A device as recited in claim 47, wherein the fluid is a cleaner for clothing.
- 1 65. A device as recited in claim 47, wherein the fluid includes a biocide.
- 1 66. A device as recited in claim 47, wherein the fluid includes at least one of an
2 insecticide, an insect repellant, an herbicide, and mixtures thereof.
- 1 67. A device as recited in claim 47, wherein the fluid is a foodstuff.
- 1 68. A device as recited in claim 47, wherein a flow rate of the fluid flowing through
2 the discharge opening is controllable by positioning the valve between the closed
3 position and the fully open position, the flow rate increasing in a substantially

4 linear fashion as the valve moves from the closed position to the fully open
5 position under constant pressure.

1 69. A device as recited in claim 47, wherein the pump is a collapsible pump
2 positioned adjacent a hinged handle.

1 70. A device as recited in claim 47, wherein the pump is a bellows pump.

1 71. A device as recited in claim 47, further comprising a semi-rigid tube forming at
2 least part of a conduit connecting the interior of the fluid container to the
3 discharge opening.

1 72. A device as recited in claim 47, further comprising a semi-rigid tube forming at
2 least part of a conduit connecting the interior of the fluid container to the
3 discharge opening.

1 73. A device as recited in claim 47, wherein the discharge opening includes a fan
2 sprayer.

1 74. A device as recited in claim 47, wherein the discharge opening includes a foam
2 sprayer.

1 75. A device as recited in claim 47, wherein the pump has ends and a peripheral
2 midpoint therebetween, an outlet of the pump being positioned towards an end of
3 the pump, an air inlet of the pump being positioned towards a peripheral midpoint
4 of the pump.

1 76. A device as recited in claim 47, wherein the pump has ends and a peripheral
2 midpoint therebetween, an outlet of the pump being positioned towards an end of

3 the pump, an air inlet of the pump being positioned between an end and peripheral
4 midpoint of the pump.

1 77. A device as recited in claim 47, wherein the pump has ends and a peripheral
2 midpoint therebetween, an outlet of the pump being positioned towards an end of
3 the pump, an air inlet of the pump being positioned between an end and peripheral
4 midpoint of the pump.

1 78. A device as recited in claim 47, wherein a neck of the container functions as a
2 handle.

1 79. A device as recited in claim 47, wherein the device is a water pistol.

1 80. A device as recited in claim 49, wherein the pump is positioned in front of a neck
2 of the container; wherein the neck functions as a handle for grasping by a user,
3 wherein only one human hand is required to simultaneously hold the device,
4 operate the pump mechanism, operate the valve, and aim the fluid discharge
5 opening; wherein the valve is controllable via a trigger; wherein the trigger is
6 adapted for actuation by an index finger of the user.